

Mr. Michael T. Davis
Algebra II Delta & Eta

Test - Unit III - First Half
Radicals, Exponentials, & Equations with Radicals
February 24, 2015

Name:

Mr. Davis

Solutions

Total ~~80~~ 80 points

Directions: You may not use a calculator that simplifies radical expressions for you.
In order to receive full credit for correct answers, all the steps in your work must be shown.

3pt 1. Simplify $4y^3 + y^2 + 7y^3 = 11y^3 + y^2$

2pt 2. Simplify $(3x^2)(5x)(6x^4) = (15x^3)(6x^4) = 90x^7$

4pt 3. Simplify $(4ab^2)^3 \cdot (3a^4b^3)^0 = 4^3a^3b^6(1) = 64a^3b^6$

3pt 4. Simplify $(6m^{-1})^{-2}$ and write the answer without negative exponents

$$6^{-2}m^2 = \frac{m^2}{6^2} = \frac{m^2}{36}$$

4pt 5. Simplify $\frac{4mn^5p^2}{12m^4n^2p^{-1}}$ and write the answer without negative exponents

$$\frac{n^3p^2p}{3m^3} = \frac{n^3p^3}{3m^3}$$

5 pt 6. Simplify $\sqrt{64f^2} + \sqrt[3]{-64f^3} = 8f + -4f = 4f$

5 pt 7. Simplify $\sqrt{48x^5} + x^2\sqrt{12x} = \sqrt{16 \cdot 3x^4x} + x^2\sqrt{4 \cdot 3x}$
 $= 4x^2\sqrt{3x} + 2x^2\sqrt{3x}$
 $= 6x^2\sqrt{3x}$

4 pt 8. Simplify $2\sqrt{35} \cdot 3\sqrt{20} = 6\sqrt{35 \cdot 20}$
 $= 6\sqrt{5 \cdot 7 \cdot 5 \cdot 4}$
 $= 6\sqrt{25 \cdot 4 \cdot 7}$
 $= 6 \cdot 5 \cdot 2\sqrt{7}$
 $= 60\sqrt{7}$

4 pt 9. Simplify $(4 + \sqrt{3})(4 - \sqrt{3}) = 16 - 4\sqrt{3} + 4\sqrt{3} - \sqrt{9}$
 $= 16 - \sqrt{9}$
 $= 16 - 3$
 $= 13$

7 pt 10. Simplify $\frac{\sqrt{80x^5y}}{\sqrt{5xy^3}} = \sqrt{\frac{80x^5y}{5xy^3}} = \sqrt{\frac{16x^4}{y^2}} = \frac{4x^2}{y}$

4pt 11. Simplify $\sqrt{10} + 6\sqrt{10} - 4\sqrt{5} + \sqrt{5} = 7\sqrt{10} - 3\sqrt{5}$

6pt 12. Simplify $3\sqrt{8} + 4\sqrt{18} - 2\sqrt{32} = 3\sqrt{4 \cdot 2} + 4\sqrt{9 \cdot 2} - 2\sqrt{16 \cdot 2}$
 $= 3 \cdot 2\sqrt{2} + 4 \cdot 3\sqrt{2} - 2 \cdot 4\sqrt{2}$
 $= 6\sqrt{2} + 12\sqrt{2} - 8\sqrt{2}$
 $= 18\sqrt{2} - 8\sqrt{2}$
 $= 10\sqrt{2}$

6pt 13. Simplify $27^{\frac{2}{3}} + 25^{\frac{3}{2}} = (27^{\frac{1}{3}})^2 + (25^{\frac{1}{2}})^3$
 $= 3^2 + 5^3$
 $= 9 + 125$
 $= 134$

4pt 14. Simplify each expression and write without negative exponents

a. $2 \cdot 5^{-1} = \frac{2}{5}$

b. $\frac{1}{10^{-2}} = 10^2 = 100$

6pt 15. Simplify $(8x^5y)^{\frac{1}{2}} \cdot (18x)^{\frac{1}{2}} = \sqrt{8x^5y} \cdot \sqrt{18x}$
 $= \sqrt{8 \cdot 18 x^6 y} = \sqrt{144 x^6 y}$
 $= \sqrt{4 \cdot 2 \cdot 9 \cdot 2 x^6 y}$
 $= 2 \cdot 3 \cdot 2 x^3 \sqrt{y}$
 $= 12 x^3 \sqrt{y}$

4pt 16. Solve $\sqrt{x-11} = 5$

$$\sqrt{25} = 5 \quad x-11 = 25$$

$$x = 36$$

4pt 17. Solve $(10x)^{\frac{1}{2}} = 20$

$$\sqrt{10x} = 20$$

$$\sqrt{400} = 20$$

$$10x = 400$$

$$x = 40$$

4pt 18. Solve $(3x+1)^{\frac{1}{3}} = 4$

$$\sqrt[3]{3x+1} = 4$$

$$\sqrt[3]{64} = 4$$

$$3x+1 = 64$$

$$3x = 63$$

$$x = 21$$

+ 4pt Optional Challenge Problem

Solve $(3x-5)^{\frac{3}{4}} = 8$

$$3x-5 = 8^{\frac{4}{3}}$$

$$3x-5 = (8^{\frac{1}{3}})^4$$

$$3x-5 = 2^4$$

$$3x-5 = 16$$

$$3x = 21$$

$$x = 7$$